HUMAN T CELL RECEPTORS FOR TREATING A WIDE-RANGE OF CANCERS

SUMMARY

T cell receptors (TCRs) are proteins that recognize antigens in the context of infected or transformed cells and activate T cells to mediate an immune response and destroy abnormal cells. The National Cancer Institute's Surgery Branch seeks interested parties to license or co-develop the use of T cell receptors (TCRs) cloned against the SSX-2 antigen for the treatment of cancer.

REFERENCE NUMBER

E-269-2010

PRODUCT TYPE

- Diagnostics
- Therapeutics

KEYWORDS

- Head
- Neck
- Melanoma
- Sarcoma
- Pancreatic
- Prostate
- Hepatocellular
- Colon
- Antibody
- Antigen
- SSX

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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DESCRIPTION OF TECHNOLOGY

T cell receptors (TCRs) are proteins that recognize antigens in the context of infected or transformed

cells and activate T cells to mediate an immune response and destroy abnormal cells. TCRs consist of two domains, one variable domain that recognizes the antigen and one constant region that helps the TCR anchor to the membrane and transmit recognition signals by interacting with other proteins. When a TCR is stimulated by an antigen, such as a tumor antigen, some signaling pathways activated in the cell lead to the production of cytokines, which mediate the immune response.

There are ten (10) known members of the synovial sarcoma breakpoint X (SSX) protein family designated SSX-1 through SSX-10. The T cell receptors (TCRs) developed by these NCI scientists have specificity for SSX-2 and deliver a robust immune response when they encounter SSX-2 expressing cells. However, these TCRs also recognize five (5) other SSX family members, including SSX-3, SSX-4, SSX-5, SSX-9, and/or SSX-10, and deliver a productive, intermediate immune response in the context of target cells expressing these antigens. This versatile antigen coverage could allow these SSX-specific TCRs to be utilized in the treatment of multiple types of cancer in a wide array of cancer patients. Infusing cancer patients with SSX-2 specific T cells via adoptive immunotherapy could prove to be a powerful approach for selectively attacking tumors without generating toxicity against noncancerous cells.

POTENTIAL COMMERCIAL APPLICATIONS

- Immunotherapeutics to treat and/or prevent the recurrence of a variety of human cancers;
- A research tool to investigate signaling pathways in SSX-2 expressing cancer cells;
- An in vitro diagnostic tool to screen for cells expressing an SSX antigen from a recognized member of the SSX protein family.

COMPETITIVE ADVANTAGES

- Selective toxicity for tumor cells
- Ability to recognize multiple SSX antigens
- Versatile antigen recognition

INVENTOR(S)

- Richard Morgan, PhD (NCI), Nachimuthu Chinnasamy (NCI), Steven Rosenberg (NCI)

DEVELOPMENT STAGE

- Pre-clinical (in vivo)

PUBLICATIONS

- Chinnasamy, N., et al., PMID: 21149604
- Valmori, D., et al., PMID 16428478
- Bricard, G., et al., PMID 15661935

PATENT STATUS

- **U.S. Issued:** US 9,345,748 (24 May 2016)
- **Foreign Filed:** European Application #11763819.7, Australian Application #2011305817, and Israel

Application #225063 are pending.

- **U.S. Filed:** Application # 15/132,863 (19 April 2016)
- **Foreign Issued:** China # ZL201180045492.0 (2 Sept. 2015)

RELATED TECHNOLOGIES

- E-105-2012
- E-236-2010

THERAPEUTIC AREA

- Cancer/Neoplasm